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Regulatory Analysis of the Resource Conservation and Recovery Act, Subtitle C

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BACKGROUND DOCUMENT

REGULATORY ANALYSIS OF THE RESOURCE CONSERVATION AND RECOVERY ACT, SUBTITLE C

This document (ms. 1941.1) provides background information and support for EPA's hazardous waste regulations

U.S. ENVIRONMENTAL PROTECTION AGENCY
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16. Abstract (Limit: 200 words) This document is one of a series providing support for regulations issued by the U.S. Environmental Protection Agency (EPA) under Subtitle C of the Resource Conservation and Recovery Act (RCRA). The regulations represent the initial effort for nationwide control of hazardous waste from point of generation, through transportation, treatment, and storage, to point of ultimate disposal.

The purpose of this analysis is not to raise issues amply discussed in the Preambles accompanying the regulations. Rather, it summarizes the alternatives considered and selected for the regulations and the impacts of the regulations.

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INTRODUCTION

Subtitle C of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 ("RCRA" or "the Act"), creates a regulatory framework to control hazardous waste, now and in the future. These rules and those promulgated under the authority of Sections 3002, 3003, 3005, and 3006 of the Act are required to implement the hazardous waste management program.

EPA has information on 400 cases of the harmful consequences of inadequate hazardous waste management. These cases include incidences of surface water and ground-water contamination, direct contact poisoning, various forms of air pollution, and damage from fires and explosions. Nationwide, half of all drinking water is supplied from ground-water sources and in some areas contamination of ground-water resources currently poses a threat to public health. EPA studies of a number of generating industries in 1975 showed that approximately 90% of the potentially hazardous waste generated by those industries was managed by practices which were not adequate for protection of human health and the environment.

Recently, EPA established a program to deal with the retrospective problem of uncontrolled hazardous waste facilities (i.e., those which are inactive, abandoned, and causing problems).

EPA believes that about 50,000 facilities have accepted hazardous waste for disposal in the past. Of these, EPA estimates that perhaps 2,000 have the potential for some degree of impact on human health and the environment, and that about 100 of that number currently present a significant potential threat to man and the environment. The latter facilities are under investigation by Federal and State authorities.

This Subtitle is designed to regulate hazardous waste management using a pathways approach. This approach regulates the path and destination of any waste found to be hazardous without particular attention to any particular industry. It is basically different from that used to regulate air and water pollution where pollutants sources are more easily identified and where specific standards can be written and adjusted for each industry.

Part 261 of the RCRA Subtitle C regulations provides a definition of hazardous waste by establishing general characteristics and, where possible, test protocols for ignitible, corrosive, reactive, and toxic waste, and by listing specific hazardous wastes. This rule thereby defines the scope of the regulatory program. EPA estimates that about 10 percent by weight of all industrial waste is brought into the hazardous waste control program by this definition.

Subtitle C requires that standards be established for generators (Part 262), transporters (Part 263), and the owners and operators of facilities which treat, store, or dispose of

hazardous waste (Parts 264 and 265). The link that will make these separate standards a system of hazardous waste control is the manifest system that is required by Section 3002 of RCRA. The manifest system will make possible tracking of individual waste loads from the generator to the ultimate destination of the hazardous waste.

RCRA specifies that the owners and operators of facilities which treat, store, or dispose of hazardous waste obtain a permit, whether these activities take place at the site of waste generation or off-site at another facility. Generators who store hazardous waste on-site for less than 90 days prior to shipment off-site, or who do not treat or dispose of hazardous waste on-site, and transporters do not need permits. Parts 122 and 124 of the Subtitle C regulation series specify the administrative procedures for application for, and issuance, denial, and revocation of, hazardous waste facility permits. These regulations are part of EPA's Consolidated Permit Program which is being promulgated separately.

As a result of numerous comments subsequent to the proposal of RCRA Section 3004 regulations in December 1978, the Agency has concluded that more study and analysis will be required to develop and support many of the national "technical" standards which will prescribe the design and construction of facilities. The Agency has chosen therefore to promulgate the regulations covering waste management facilities on a phased basis. Phase I includes primarily the requirements which are incumbent

upon facilities during the interim status period (between the effective date of the regulations and final action on a permit), plus most of the administrative requirements for permitted facilities. Since the general technical standards will be lacking, it will not be possible to grant permits until Phase II of the regulations for waste management facilities are issued later this year.

It is EPA's responsibility under RCRA Subtitle C to develop through these standards and the manifest and permit system a comprehensive national system of hazardous waste control. This system is intended by Congress to be implemented through the States where States have programs which are equivalent to the Federal program. For this purpose, EPA is developing guidelines for judging the equivalency of State programs (Part 123) and for allocating grant funds to State programs (Part 35). Implementation of the hazardous waste program through the States effectively increases the resources available and should result in better protection of human health and the environment.

In addition to the rules described above, EPA has issued a Federal Register Notice (45 FR 39: 12746-12754) describing the requirements for Preliminary Notification under Section 3010 of the Act, and providing a form for such notification which may be used to satisfy those requirements. EPA estimates that about 72,000 hazardous waste generators, transporters, and facility owners or operators must notify EPA of their activities. Use of the EPA notification form will provide a

uniform format for data suitable for computer processing.

This Regulatory Analysis covers not only the regulations promulgated in this action (i.e., 40 CFR Parts 260, 261, and 265), but also two previously promulgated regulations, i.e., the requirements for generators under Part 263, and the notification procedure under Section 3010 of RCRA. The general status standards for facilities (Part 264) will be covered by a separate analysis which will accompany the Phase II regulations.

The purpose of this Regulatory Analysis is not to raise issues amply discussed in the Preambles accompanying the regulations. Rather, this analysis will summarize the regulatory alternatives considered and selected for the RCRA Subtitle C regulations and the impacts of the regulations. Readers desiring additional information are urged to refer to the appropriate Preambles or Background Documents, or to the Environmental and Economic Impact Analyses which are available at EPA Regional libraries and at the EPA headquarters library, Room 2404(M), Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460. This regulatory analysis coupled with the many supporting documents complies with the requirements of Executive Order No. 12044.

ALTERNATIVES CONSIDERED AND SELECTED

A number of regulatory alternatives for Subtitle C are general in nature and cut across the entire program. Others are specific to a particular regulation. The general alternatives are discussed first followed by major alternatives for specific regulations in turn.

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a. General Alternatives

In formulating the Subtitle C program, EPA was faced with general regulatory structure options respecting the types of regulations to write, the level of stringency of these regulations, and timing and phasing of the program elements.

As mentioned earlier in the preamble, the standards for hazardous waste management facilities will be phased to allow EPA more time to gather support data and information for many of the more controversial and complex of the national technical requirements. Phase I is promulgated in this action. The Phase II regulations will be promulgated later this year. These regulations will contain a great deal of flexibility for the Regional Administrator to use his judgment in deciding the environmental adequacy of a facility. They will be sufficiently comprehensive to allow the permitting process to commence but will not contain many of the specific technical requirements which the Agency hopes to promulgate over the next several years (Phase III) as more information is developed.

Many of the general alternatives discussed below more fully relate to the Phases II and III programs. However, since they also relate to the regulations under Sections 3001, 3002, and 3003, and, to a limited extent, to the interim status standards of 3004, they will be discussed here for completeness and clarity.

Types of Regulation

A major issue was whether to write general performance standards, based on ambient or emission levels for air, water, and land media, or to be more explicit by writing engineering design and operation standards. The former provide flexibility and tend to encourage technical innovation. The latter provide specific guidance to facility operators and permit writers, and are easier to enforce.

After substantial Agency analysis and public comment on this issue, EPA has concluded that it will be a long time before it can write and rely completely upon regulations which set out the concentrations and total amounts of hazardous substances which can be emitted from a facility. This is because the nation's toxicologists have not yet developed (and are not likely to develop in the near future) the acceptable limits for human ingestion and inhalation of the exceedingly large number and variety of hazardous constituents in industrial waste.

On the other hand, it is difficult to write specific design and operating standards which make sense for all types of facilities, handling many different kinds and quantities of waste in widely varying circumstances of location, rainfall, hydrology, and population density. Further, it is EPA's belief that technological innovation should be encouraged in this new program.

In the three phases of the regulations for hazardous waste management facilities, the Agency intends to strike a balance

between the two types of standards, incorporating the best features of both. The interim status standards consist primarily of administrative and operating requirements based on good management practice. They are specific but largely nontechnical, i.e., they do not radically affect facility design.

It is intended that later regulatory actions (Phases II and III) will contain a set of "operational performance standards" which will consist of descriptions of the parameters to be achieved to assure protection of health and the environment. "Operational" performance standards specify emission limits or results of operations which, if met, the Agency believes will provide an adequate margin of protection to human health and the environment. They are not directly keyed to any predetermined acceptable level of human exposure, which, as was previously discussed, cannot be done at present. They may ultimately include such performance standards as destruction efficiencies for incinerators and discharge limits to soil, ground water, and surface waters. They will, however, be implemented to a major degree based on the judgment of the Agency's permitting staff as to how well a given facility meets or will meet the performance requirements.

Over a period of years, as support data are accumulated, the Agency will issue additional explicit design and other technical standards for facilities. Many of these engineering design and operation standards will contain allowable variances in recognition of the many different possible circumstances of

hazardous waste management nationwide. The operational performance standards which will already be in place, will provide a basis for gauging equivalency of proposed variances. Further, EPA believes this regulatory structure will allow technological innovation.

Stringency Levels

A large number of commenters on the proposed rules suggested that the level of stringency for a particular standard should vary with the degree or class of hazard of the waste, or that specific standards of variable stringency should be written for each industrial category or source of waste. Another group of commenters felt that less stringent requirements should apply to existing facilities than to new ones.

After substantial analysis of the degree of hazard issue, the Agency has concluded that the potential for damage to man and the environment depends on the management circumstances of a waste as well as on the intrinsic properties of the waste, that these two factors cannot be divorced, and that it is mismanagement of the waste which presents the greater problem. Yet, the Agency recognizes that, it is not always necessary to apply the most stringent standards necessary for on type of waste, to all waste types in all management situations.

Consequently, in the Phase I rules the Agency has developed specific management requirements for a few classes of hazardous waste (e.g., ignitible, reactive, and incompatible waste) which require different or more stringent control in

certain types of facilities. However, no distinction as to intrinsic degree of hazard is made in the definition of hazardous waste or within or between the classes of waste. The Agency expects to expand the use of the class of hazard system in the Phases II and III regulations.

To date, environmental regulations generally have been written on an industry-specific basis. RCRA requires that standards be written for generators, transporters, treaters, storers, and disposers of hazardous waste, but provide no specific direction to vary those standards by type of generator. The development of industry-specific standards was nevertheless considered in the design of the Subtitle C program.

In the course of this consideration, it was determined that most waste classified as hazardous requires similar management techniques. This is true not only for the financial and administrative requirements of the program, but also with respect to performance, design, and operating standards for treatment, storage and disposal facilities. However, it was also determined that some waste can be handled with differing facility design and operating standards or differing administrative requirements, and still be handled so as to provide adequate environmental and human health safeguards. Thus, these regulations have not been designed on an industry-by-industry basis. The rules provide general standards applicable to all waste for transportation, treatment, storage, and

disposal, but include specific conditions for many of the treatment, storage, and disposal regulations by which the requirement is waived or modified.

The proposed rules made no distinction between new and existing facilities. The Agency now believes, as a result of recent Congressional action, that Congress intends that such distinctions may be made, particularly for existing surface impoundments which are part of wastewater treatment systems built to meet the requirements of the Clean Water Act. These distinctions are not particularly relevant to the interim status regulations. However, the Agency intends to specify different requirements for new versus existing wastewater treatment surface impoundments during Phases II and III, provided owners or operators of exisiting facilities can show via ground-water monitoring that their facilities are not leaking statistically significant amounts of hazardous waste constituents into ground-water supplies.

Phasing

As mentioned earlier, the Agency adopted a three phase approach to promulgating the Section 3004 regulations for treatment, storage, and disposal facilities. The decision was made to allow the Agency additional time to gather data for the technical requirements governing how facilities will be designed and run. Because it delays implementation of the full status program there are other results. The additional time should allow for a smoother transition from a largely unregulated

industry to a fully regulated state. Manpower needs and costs will be spread over a longer period, reducing the impacts on both the regulatory agencies (State and EPA) and the regulated community. There will be additional time for the Agency to explain the regulatory program and for industry to gear up a compliance program. This should greatly reduce the confusion that often surrounds the implementation of a new regulatory program. There are also some disadvantages. It can be argued that every delay comes at a cost to human health and the environment. However, the Agency believes that these modest delays will have no significant impact since industry will be moving to comply with the interim status regulations which will provide significant improvement over current practices. Also, insofar as the delay leads to better regulations and smoother implementation, it may actually speed overall compliance by reducing lost motion and implementation delays due to confusion, and perhaps may result in less time consuming litigation.

A number of other phasing options were explored. One method of phasing is to use a classification of degree of hazard to regulate the most hazardous waste first and to gradually include less hazardous waste. However, it was determined that degree of hazard is a function of the state of the waste in its management cycle as well as the intrinsic properties of the waste, and that it is mismanagement of the waste which presents the greater problem. Priority action on permit applications can more accurately reflect the phasing that is desirable.

Phasing can also be done by industry grouping, or by including the generators of the largest quantities first and gradually including generators of successively smaller waste streams in the regulatory system. Aside from a few exceptions, the Agency will at first regulate only generators of more than 1000 kg of hazardous waste per month. However, the Agency believes that 100 kg is the more appropriate level and intends to expand application of the regulatory programs to all generators producing more than 100 kg per month within the next two to five years. This issue is discussed further under the discussion of "exclusions."

With regard to phasing by industry grouping, the Agency lacks the data and methodology to determine which industry wastes pose the greatest hazards and thus should be regulated first. In the absence of such a rating system, the choice between industries would be on a random basis with attendant equity problems. One of the advantages of phasing by industry is that it allows development of specific standards for each industry. However, the Agency has found that the management methods useful with wastes from one industry do not vary greatly from those used for wastes from another. Thus, by and large, EPA has not found it useful to develop industry specific regulations.

Priority action on permit applications is another phasing option which the Agency intends to use. The Agency will balance the apparent hazard associated with the wastes and the apparent

suitability of the facility against other factors such as the past records of owners or operators, the availability of alternative waste management facilities, the available Agency resources, and other program priorities (enforcement, etc.) in prioritizing permit applications. This phasing approach has the added advantage of flexibilitly to accomodate changes in Agency priorities and resources.

b. Hazardous Waste Definition

Characteristics and Lists

Section 3001 mandates that two mechanisms must be used for determining which wastes are hazardous and thus must be managed in accordance with the Subtitle C regulations. The first is a set of characteristics which define a waste as hazardous, and the second is a list of particular hazardous wastes.

Two criteria were used to select appropriate characteristics by which to define hazardous waste. First, a solid waste possessing that characteristic must meet the statutory definition of hazardous waste as stated in Section 1004(5) of RCRA. Second, the characteristic must be defined in terms of one or more physical, chemical, toxic, radioactive, infectious or other properties for which test methods are reasonably within the performance capability and capacity of generators of solid waste (or reasonably determinable by generators of solid waste through knowledge about their waste).

The following candidate characteristics were developed:

(1) Ignitability

(2) Corrosiveness

(3) Reactivity

(4) Toxicity

(5) Radioactivity

(6) Infectiousness

For each of the characteristics above, several alternatives were considered. The Agency could have adopted each as a means of identifying hazardous waste, adopted some of the characteristics and limited the scope of their application, deferred adopting any characteristics pending further study or used certain characteristics solely to assist in development of hazardous waste lists.

Adoption of a characteristic as a means of identifying hazardous waste requires a generator to determine whether his waste exhibits that characteristic which often entails testing (40 CFR 262.11). Adopting a characteristic in a limited form reduces the amount of testing required since the scope of its application has been limited. Using a characteristic solely for listing purposes removes the burden of testing from the generators, unless the generator wishes to prove that a particular waste stream is not hazardous. In this case he could test his waste to show that it differs fundamentally from the other wastes in the listed category. Deferring adoption of a characteristic pending further study results in

the acquisition of additional information to determine the appropriateness of that characteristic for hazardous waste definition.

Ignitability, corrosiveness, reactivity, and limited toxicity were selected as characteristics to define hazardous waste for the proposed as well as final regulation because they represent readily identifiable hazards which pose an obvious threat to human health and the environment and are likely to be exhibited by a number of wastes. Wastes may be listed where the Agency has information that they meet these characteristics but a waste meeting these characteristics is hazardous even if not listed. Also, for listing purposes, the Agency is utilizing an acute toxicity criterion and an expanded toxicity criterion which includes consideration of several other factors. Among the other factors that are considered for the listings are: the quantities of the waste generated; the potential damage to human health and the environment that may result from improper management of the waste; and the nature and severity of damage to human health and the environment that has previously resulted from improper management of the waste. The criterion for listing infectious waste has been deferred pending completion of additional study. It should be noted that delisting procedures are provided so that a generator may show that a listed waste from an individual facility is nonhazardous.

Exclusions

One of the major issues in the development of the regulations is the exclusion of wastes from the waste management system. Wastes such as domestic sewage, industrial waste water point source discharges, irrigation return flows, and radioactive wastes regulated under the Atomic Energy Act of 1954 are excluded by the statutory definition of solid waste. A second group of wastes is excluded from the regulatory definition of hazardous waste because the Agency believes that it is not the intent of Congress to regulate these as hazardous wastes. This group includes the following:

- Household garbage and refuse, and residuals from recycling garbage and refuse
- Agricultural wastes (crop and logging wastes)
- Animal wastes returned to the soil as fertilizer or soil conditioners
- Mining overburden
- *In situ* mining wastes

Another major issue is the regulation of hazardous wastes destined for use, re-use, reclamation or recovery. Since one of the purposes of RCRA is to promote resource recovery, many commenters felt that special consideration should be given to recovery of hazardous wastes as a means of fostering that activity. The basic options available to the Agency were (1) no controls over hazardous waste destined for recovery, (2) limited controls either on transportation (manifest) or

the use or recovery activity (limited requirements), or (3) full coverage. The Agency believes it is worthwhile to foster recovery of hazardous wastes on the grounds that, if recovered, the wastes no longer exist and are thus not available to be troublesome through future years. Also, recovery extends disposal capcaity and usually reduces net energy use. On the other hand, without any controls, these wastes can and do get "lost", spilled, and mismanaged in the transportation link, or can be inadequately managed at the recovery facility. The Agency is still considering this difficult issue and undertaking further study. In the interim, wastes which have been listed as hazardous but which are recovered will be subject to all of regulatory controls (manifest, recordkeeping and reporting, packaging, storage, etc.) except for the regulations affecting treatment processes. In the case of a listed waste burned in a boiler, the waste would have to be manifested if shipped offsite and any storage facilities would require a permit. The boiler itself would not be regulated. Additional regulations covering recycled wastes may be forthcoming.

Another major issue involves the lower limit to be placed on hazardous waste volumes to be controlled. There are several reasons for setting a lower limit on the amount of waste which triggers the Subtitle C regulatory controls. While there is some evidence of damage due to small quantities of hazardous waste, most damage cases studied by EPA involve medium to large quantities. Further, there is some evidence that co-disposal

of small quantities of hazardous waste with municipal solid waste in well designed and operated solid waste facilities, is in most respects, as environmentally acceptable as disposal of such quantities at a hazardous waste facility. In addition, exclusion from control of producers of small amounts of hazardous waste would eliminate the paperwork burdens of transport manifests, reporting, and recordkeeping on hundreds of thousands of producers. The limited EPA and State resources available could not effectively regulate this number of additional generators, and thus this exclusion frees scarce resources to concentrate on generators of larger amounts of waste who, according to EPA studies, produce most of the total amount of hazardous waste.

Thus, the Agency considered establishing an exclusion based on the amount of hazardous waste produced in a given time period. Establishing the cutoff for the exclusion necessitated considerations of both the environmental benefit and administrative burden and cost.

Several cutoff levels were considered: 27 lbs, 100 kg, 250 kg, and 1000 kg of hazardous waste produced and disposed of per month. To put these levels into perspective, 100 kg (about 220 lbs) amounts to roughly one-half of a 55-gallon drum, while 1000 kg can be contained in about five 55-gallon drums. At the 100 kg level, about 74 percent of the manufacturing generators (SIC 20-39) would be excluded but

99.8 percent of all hazardous waste would still be covered. At the 1000 kg level, the percentage of generators excluded would be increased to 91 percent, and the portion of hazardous waste covered would be reduced to 99.0 percent.

The Agency proposed a small quantity generator cutoff level of 100 kg/month, and still believes this to be the proper level, based on a reasonable tradeoff of quantity of waste versus number of generators exempted, for effective protection of human health and the environment. Also, the Agency knows of few damage incidents involving less than 100 kg quantities. However, neither the Agency nor the States (for those States which will conduct the hazardous waste program) have adequate resources to administer a program involving the number of generators who would be brought into the system at the 100 kg/month level. Therefore, the initial program being promulgated at this time will adopt a cutoff level of 1000 kg/month for most hazardous wastes; the Agency intends to reduce this level to 100 kg/month in two to five years after this promulgation.

This general small quantity exemption level is being lowered for certain commercial products (and their containers or spill clean-up residues) if discarded, and for listed hazardous wastes whose constituents have been shown to cause major environmental problems even in very small quantities.

c. Generators

Other than for the "exclusions" issue, the regulatory options available to the Agency which involved generators of wastes, centered primarily on the 90 day storage provision, on the form and structure of the manifest system, and on record-keeping and reporting.

Virtually every generator of hazardous wastes stores wastes on-site long enough to accumulate an economical volume either for off-site shipment or for treatment or disposal. The Agency determined, however, that most generators store hazardous waste for less than 90 days and that this very short term storage which is normally conducted in tanks and drums, presents little hazard to human health and the environment. Also, the Agency recognizes the stated Congressional intent that the program not interfere with the generators' production process. As a result, the Agency chose to exempt generators accumulating hazardous wastes on-site for less than 90 days for subsequent shipment off-site from the requirement to obtain a permit.

Section 3002(b) of RCRA requires EPA to establish such standards for reporting as the Administrator deems necessary to protect human health and the environment. Three major alternatives were considered for generator reporting: (1) a quarterly summary of all hazardous waste generated; (2) an annual waste summary with the additional requirement that manifests not returned to a generator within 45 days be reported

immediately; and (3) the same annual summary, but manifest exceptions to be reported quarterly.

EPA believes the annual hazardous waste summary with the 45-day exception reporting requirement provides the optimum combination of long term information on waste generation and movement coupled with short term notification of missing shipments. The generator reporting standard chosen therefore requires all generators to provide annual summaries of hazardous wastes handled and an exception report if manifests are not returned within 45 days after waste shipment. The exception report must also include a summary of the generator's efforts to determine what happened to the errant shipment.

d. Transporters

Section 3003 of RCRA requires that EPA establish regulations which control the transportation of hazardous waste. The primary issue centered on the proper relationship between EPA requirements and the Department of Transportation's authority. Some of the issues included structuring EPA's manifest requirement to account for existing DOT shipping document practices, additional safety provisions, a permit program for haulers, minimum insurance coverage for spills, and reporting requirements in the event of a spill. Major alternatives to each of these issues are discussed below.

The Agency determined that the role of DOT in the RCRA transporter regulation structure should be as great as possible. Transporters perceive DOT as the regulatory authority, and

DOT's resources and expertise in this area surpass EPA's. Therefore, independent EPA regulations would be counterproductive. An alternative would be for EPA to produce no RCRA regulations. DOT's program for the transportation of "hazardous material" would cover the bulk of "hazardous waste" as defined in Section 3001. As a suboption, EPA also considered adopting DOT regulations which would result in enforcement powers for both agencies and extension of the coverage of the regulations to intrastate commerce. Another alternative was to influence DOT to make its regulations compatible with RCRA before EPA adopted them. In those instances where the Agency found DOT authority lacking, EPA could write supplemental regulations to add flexibility. EPA adoption of the DOT regulations would allow transportation experts to handle the problems directly and would reduce confusion. In light of these considerations, EPA and DOT developed consistent regulations which build on the existing DOT hazardous materials rules. In essence, EPA and DOT chose the last option. EPA's rules incorporate DOT's regulations and include additional requirements in those instances where there is no authority under DOT's legislation.

As required by the Statute, the Agency is establishing a manifest requirement for transporters to reflect the "cradle-to-grave" hazardous waste control concept. The two options were to require detailed information on a specific manifest form which must accompany the waste at all times, or to use

the existing DOT shipping paper information and format. The first option would provide for close control and perhaps the ability for somewhat tighter enforcement. The second option would reduce the burden on the transporters and would provide the minimum amount of data needed to fulfill the manifest's objectives. The Agency has chosen to adopt a slightly modified version of the existing DOT shipping paper concept. Specifically, a hazardous waste manifest will consist of the information currently required on DOT shipping papers with minimal additions. No new form is required. The Agency believes that the requirement that generators submit an exception report immediately when a manifest becomes lost will provide close control and sufficiently tight enforcement.

The Agency considered establishing a permit program for haulers of hazardous waste but has been unable to determine any compelling need for it. The Agency believes the RCRA regulations and associated penalties counter any economic benefit to be gained by a transporter who operates irresponsibly. Thus, registration and control via, a permit program would yield no substantial benefits in the Agency's view.

EPA considered requiring that transporters of hazardous waste have adequate insurance in the event of a spill. Many transporters have such coverage now, and to that extent, additional regulation may be unnecessary. Due to a lack of information the Agency chose to study the issue. If it is determined that spill insurance should be required, EPA will write such regulations.

Lastly, EPA considered the issue of spill reporting. Requiring the transporter to report hazardous waste spills through the existing DOT reporting mechanisms, provides significant environmental protection and expands EPA's information base. Therefore, this requirement is included in the final rules.

e. Facilities

Section 3005 of RCRA requires the establishment of a permit program for hazardous waste facilities. Section 3004 establishes the standards on which the permits will be based. However, regulations for Section 3005 and the State authorization program under Section 3006 are being integrated with the NPDES and UIC programs under 40 CFR Parts 122, 123, and 124. These regulations are being promulgated separately. Therefore, the bulk of this discussion will focus on alternatives considered under Section 3004 or, more specifically, the interim status standards for treatment, storage, and disposal facilities. Several of the major issues associated with the facility regulations were dealt with earlier under "general alternatives". Among these were the questions of what type of standards to write for facilities, and several questions concerning phasing and stringency levels. These will not be discussed again here.

The question of how to regulate inactive hazardous waste management sites was a major issue considered in the development of the program. RCRA is written in the present tense and its

regulatory scheme is organized in a way which seems to contemplate coverage only of those facilities which continue to operate after the effective date of the regulations. Thus, the Section 3004 standards and the Section 3005 permitting procedures are not directed at inactive facilities. EPA has decided to use the imminent hazard powers of Section 7003 to act in instances where a threat to public health or the environment is presented by an inactive site. Congress also has under consideration a bill which would set up a fund which could be used to locate and cleanup any inactive problem sites.

Development of workable regulations for the control of emissions from volatile wastes has been especially difficult. The Agency considered the following general alternatives: (1) no control of volatile emissions, (2) prohibiting emissions from wastes with a true vapor pressure greater than 78mm Hg at 25°C., or (3) control of volatile wastes on a case by case basis. Based on technical concerns about the adequacy of a vapor pressure definition of volatile hazardous wastes, and the unavailability of an alternative definition, the Agency has chosen not to control emissions from volatile wastes directly for now. The Agency will continue efforts to develop a generic definition of volatile hazardous waste and an associated test method. The Agency also may regulate known problem volatile wastes on case-by-case basis.

A related issue involves the Agency's proposed rules limiting storage of wastes to closed tanks and containers because

of the potential for emissions from volatile wastes. Many commenters pointed out that this regulation was inconsistent with those for treatment or disposal operations. These commenters also pointed out the impracticality of requiring everything to be stored in tanks and drums. The Agency developed its policy in this matter based on its interpretations of the RCRA definitions of "storage" and "disposal". The RCRA definition of disposal seemed to allow some escape of pollutants to the environment while storage seemed to require zero discharge. Upon reanalysis, the Agency concluded that the important distinction between a storage and disposal facility, is the intent of the owner or operator to remove wastes at closure. For depending upon the answer to this question, the closure and financial requirements regulations will change. As a result of this reanalysis, the Agency will allow storage in most types of facilities and accept limited air emissions.

Financial requirements for hazardous waste management facilities are required by Section 3004(6) of RCRA. This Section calls for requirements respecting ownership, continuity of operation, and financial responsibility for hazardous waste management facilities as may be necessary or desirable. Four areas of financial requirements were identified: funds to assure site closure, funds to assure post-closure site monitoring and maintenance, provision for third party liability coverage and funding of remedial action both during the life of the site and after closure. Requirements for post-closure

monitoring and maintenance, and post-closure liability and remedial action pertain only to disposal facilities because no hazardous waste will remain at treatment or storage facilities after proper closure.

The major choices facing EPA for each of these areas were whether to set requirements leading to private arrangements; to seek additional legislative authority to establish a government administered fund; or to defer and conduct further studies before rulemaking.

There are precedents for requiring a facility to obtain assurance of funds to accomplish proper closure. Strip-mining operations, for example, are required to set aside sufficient funds before operation to assure site restoration. In response to comments on the proposed regulations, EPA determined that deposit in a trust fund of all of the money needed to close a facility, on the effective date of the regulations, placed an unacceptable burden on the regulated community. As a result, EPA is now proposing that facilities take up to 20 years or until closure, whichever occurs first, to accumulate all of the funds for closure. Additionally, the Agency considered a number of alternative financial mechanisms to a trust to provide the necessary assurance and reduce the economic impact. EPA believes surety bonds and letters-of-credit will provide adequate assurance. Also, the Agency developed an assets test as a variance mechanism available to large, secure firms. However, since the Agency is not used to dealing with financial

mechanisms, and the subject is extremely complex, EPA has decided to repropose these regulations to allow the public, the regulated community, and the financial institutions who will provide coverage, an opportunity to comment on the regulations.

Similar alternative mechanisms are envisioned for assuring funds for post-closure care. These are also being reproposed.

The Agency has decided not to require site-life liability coverage for non-sudden incidents for treatment, storage, and disposal facilities during the interim status period. This decision resulted from an Agency finding that the most common mechanism for this coverage, liability insurance, might often only be available in conjunction with the granting of a permit. Permits are not granted as part of the interim status activities. The Agency intends to promulgate regulations in Phase II requiring liability coverage during site operations as a condition of permitting. Many facilities already have such insurance for sudden events. The Agency is reproposing an interim status requirement that all facilities have liability coverage for sudden accidents during the life of the site.

The Agency has been unable to identify a viable mechanism to assure funds to cover third party liability claims and pay for any necessary remedial action (cleanup) after closure. The costs for cleanup and to settle suits have run into the multi-millions of dollars in certain cases in the past. While the RCRA regulatory program will reduce the incidence and

severity of these problems, mistakes and miscalculations may occasionally occur. Insurance firms generally will not cover such eventualities because of the open ended nature of the risk. It is also not possible to establish individual trust funds sufficiently large to cover the possible needs. Congress is considering legislation which would establish a national fund, into which all permitted facilities would pay, for liability and remedial action indemnification after the facility has been properly closed.

f. Notification

Section 3010 requires all generators, transporters, and facility operators to notify the Administrator of their hazardous waste management activities. The Agency was faced with the option of whether or not to publish regulations under this section. It was decided that, since RCRA is specific in its requirements, additional regulations were not necessary. Yet, a need existed to alert a large group of persons to these notification requirements to clarify specific requirements, and to standardize data formats. As a result the Agency published a notice of the requirements in the Federal Register.

Two additional issues were dealt with: the degree of flexibility in notification reporting procedures and the level of confidentiality to be maintained by the Agency.

A regorous approach to the notification procedure question would require each person to test his waste and submit detailed analytical data. The Agency decided to request, on

a standard form, the minimum amount of information required by the statute. Therefore, for Section 3010 notification purposes testing is not necessarily required to prove whether or not a waste is hazardous. Much of the hazardous waste is listed in the Part 261 regulations, and a simple declaration that the person handles a waste with the characteristics included in Part 261 will suffice if it is not listed. The Agency believes that these procedures will enable persons to fulfill their statutory obligation under Section 3010 at a reasonable cost. The option of allowing the States to be notified in lieu of the Agency was rejected because of questions surrounding the legality of the proposed regulation's concept of Limited Interim Authorization. This concept would have allowed EPA to authorize States to conduct notification activities before the effective date of authorization under Section 3006(c).

Provisions for confidentiality of notification data would protect trade secrets but would make it more difficult for the public to obtain a clear identification of hazard levels. In order to balance those concerns, EPA has established a confidentiality procedure which puts the burden on the notifier to demonstrate the need for confidentiality if the public requests access to data. The Agency's confidentiality procedures comply with the Freedom of Information Act and are contained in 40 CFR Part 2.

ENVIRONMENTAL IMPACTS

A draft Environmental Impact Statement (EIS) accompanied the proposed regulations in December 1978. That analysis was based on the proposed general status requirements and thus was not totally relevant to these interim status regulations. Additionally, the universe of wastes controlled and several important provisions of the generator and facility regulations have changed since the proposed regulations.

As a result, the Agency has completed an EIS covering the interim status standards for facilities (Part 265) plus those regulations being issued pursuant to §§3001, 3002 and 3003. This EIS is available for review in the EPA regional office libraries and in the EPA headquarters library, Rm. 2404(M), Waterside Mall, 401 M St., S.W., Washington, D.C. 20460.

Because of the lead time necessary to produce the analysis, the EIS is based on a preliminary draft of these final regulations. Thus, it does not correspond to regulatory changes made later in the process. The Agency is evaluating the effect of these changes on the final EIS.

Another EIS will accompany promulgation of the Phase II facility regulations later this year. This EIS will evaluate the impact of the general regulatory program, including the permitting function, and will be widely available. It is expected that this latter document will be added to, revised,

and updated as the Phase III facility standards are promulgated, and the hazardous waste lists and Part 261 are expanded.

As with other environmental regulations, the environmental impacts are clearly favorable - that is the purpose of the regulatory program. However, a problem exists in attempting to to quantify the enviromental and human health improvements - particularly in terms of dollars. This is so because it is difficult to measure the changes affecting human health and the environment in many cases and difficult to place a value on benefits such as a reduced incidence of cancer. The next section of this analysis addresses the economic benefits which accrue from avoiding the substantial costs of cleaning up hazardous waste facilities which are improperly designed and managed. But these estimates do not include the avoidance of costs of health problems (spontaneous abortions, nervous disorders, higher cancer incidence, etc.) which often go along with problem waste sites. Nor do such estimates normally include avoiding the costs of damage to fish and wildlife populations. These costs are not normally quantifiable but are real nonetheless.

These regulations, and those to be promulgated in later phases, will improve the environment and reduce the negative impact of hazardous waste management on human health in a variety of ways. Following is a brief list of some of the many expected improvements:

(1) Ground-water pollution from leaching of toxic pollutants from improperly designed and managed landfills will be reduced.

(2) Poisoning and injury due to direct contact by children and others with randomly dumped wastes will be reduced.

(3) Pollution of surface waters from hazardous wastes stored or disposed in fields and on riverbanks will be reduced.

(4) Illicit dumping of wastes in farm fields, wooded areas, along roadsides, and in ditches and streams will be reduced.

(5) Emission of toxic gases from improperly run incinerators will be reduced.

(6) Accidents, mistakes, and malfunctions at hazardous waste management facilities, which could affect people near the site, will be reduced in number and in severity, due to monitoring and inspection requirements and required emergency equipment.

(7) Contingency plans will spell out emergency response procedures to ensure rapid and effective action to minimize any danger to off-site residents and the environment.

(8) Facilities will be decontaminated or otherwise secured at closure to reduce the possibility of future human health or environmental impact.

The Agency believes these improvements will be substantial and noticeable. They are not, however, quantifiable since records of past practices and problems have been almost nonexistent and the degree to which the benefits will be realized is open to some conjecture.

In addition to what is expected to be a major reduction in the human health and environmental impacts associated with hazardous waste management activities, there will be some secondary social and resource impacts associated with the regulatory program. These are summarized in the following paragraphs.

One of the major economic impacts of the regulatory program is likely to be some plant closings and job losses in a few segments of some industrial categories (see the next section of this analysis). This may have some secondary social impacts as a result of the relocation of some of the affected workers and their families. This is likely to happen only in communities or areas where plants being closed constituted the primary source of employment.

On the other hand, the new requirements for hazardous waste management will likely result in the need for additional workers to track the hazardous wastes; to transport the wastes; and to store, treat, or dispose of the wastes at both off-site and on-site facilities. Additional workers will also be required for facility construction and modifications, and to administer and enforce the regulations at both the State and Federal levels (see the resource estimates later in this analysis). Some population shifts could occur if the required number of workers is not available where needed, particularly where treatment or disposal sites are located in rural or undeveloped areas. Any shifts in population are expected to be relatively small on a national or State scale, although there may be localized instances of a relatively large influx of workers.

In the short-term, an increased public awareness of problems that have been associated with improper management of hazardous wastes, in the past accompanied by the public notice and participation aspects of this regulatory program, will probably add to the opposition to local siting of hazardous waste management facilities which has been on the increase in recent years anyway. However, in the long-term, promulgation of the regulations coupled with vigorous enforcement, increased public participation in the facility siting process, and specific demonstrations that wastes can be adequately managed and that the regulatory program is effective in ensuring adequate management, should serve to lessen such opposition and lead to less difficulty in siting facilities.

The potential for the degradation of both ground water and surface water will be reduced, as previously mentioned. To the extent that degradation of water quality has or would have resulted in a decreased supply of surface water or ground water being available to consumers for use, there will be an additional supply of water available and a reduction in treatment costs, and fewer restrictions on the productive use of these water supplies.

As discussed later in this analysis, the new regulations will increase the cost of hazardous waste management. As a result, the regulations provide an incentive for generators to modify processes to enable increased recycling of hazardous wastes generated by specific processes, and to alter the nature of the wastes generated to lessen their hazardousness. Such changes

will be waste stream and process-specific. Additionally, since the regulations strongly discourage placing ignitable wastes in landfills, landfarms, and surface impoundments, an incentive will exist for increased incineration of such wastes, with the possibility of energy recovery.

Although as a result of the regulatory program, more land must be dedicated for hazardous waste management, a net benefit in land use impacts is expected. Random, illicit, and haphazard disposal will be reduced and ultimately eliminated with a corresponding reduction in the destruction of land use values. Also, the regulations are expected to reduce the generation of wastes and lead to increased recycling and treatment of wastes which, in the longer term, will reduce the amount of land necessary for disposal.

A modest facility modification and construction program will be needed to bring existing facilities into compliance with regulations. Construction of new facilities will also be necessary to replace inadequate ones and provide additional capacity. This will result in increased energy use. Increased energy use will also result from a few of the changes in storage, treatment, and disposal operations mandated by the regulations (e.g., incinerators must be preheated using auxiliary fuel before adding wastes). The expected increase in resource recovery will also likely require the input of additional energy. However, energy savings from increased energy recovery, from elimination of the need for subsequent treatment or disposal of wastes, and from substitution of recycled products for virgin products, should result in a net energy savings due to resource recovery operations.

ECONOMIC ANALYSIS

a. Benefits

In the economic sphere, there are both costs and benefits associated with this regulatory program. A previous discussion centered on the substantial direct benefits to human health and the environment expected from the regulatory program. But what of the expected impact on the economy? In addition to the non-quantifiable economic benefits expected from decreases in human health problems and in pollution of our air, land,and water, EPA expects an improvement in economic efficiency and equity, and substantial direct savings from avoiding cleanup costs in the future.

An economy functions efficiently and equitably when the price of goods produced in the society reflects the actual social and private costs of production. Until now, in most places firms could dispose of wastes in environmentally unsafe ways at costs substantially less than for adequate disposal. Thus, the price of goods often did not reflect the full social costs of production.

Pre-RCRA management practices were inequitable because costs of hazardous waste disposal often fell randomly on individuals affected by improper management or on the public at large through the need to use tax revenues to clean up inadequate facilities. It would be more equitable, for the costs of adequate hazardous waste management to fall on the consumers and producers of the products which generate the hazardous wastes.

There are many examples of these inequities. At the Love Canal, in New York, a chemical company disposed of about 20,000 tons of waste. Some 30 years later, the waste chemicals were found seeping into the basements of houses and surfacing in their back yards. These residents have paid heavily for inadequate disposal practices through health effects such as increased spontaneous abortions and decreases in birth weight of babies. There is some evidence of increased cancer levels and birth defects as well. The Federal and State governments have spent millions of dollars of tax revenues to clean up the area and relocate the residents. Nearby residents have suffered losses in property values. None of these things would have been necessary had the generator paid for environmentally safe disposal.

At Hopewell, Virginia, a firm producing pesticides used the town's municipal sewage system, which discharged into the James River, for disposal of toxic residues. The firm also inadequately stored waste at their production site which led to contamination of the area. They were therefore able to reduce the price of their product by the few cents per pound that adequate disposal and storage would have cost. As a result of pesticide contamination, the James River has been closed to most fishing for several years. Some fishermen who earned a living from the James River were forced to find new work. These fishermen paid for waste disposal in lost jobs. More equitably, the people who produced and who used the insecticides should have paid for proper disposal of the wastes.

In a number of instances hazardous waste has contaminated drinking water wells. People using the wells have suffered from health effects, and in many cases have paid to have new wells drilled into uncontaminated aquifers or to bring in piped water from distant treatment plants. In these cases, the well users have paid, rather than the generators and consumers.

Pre-RCRA disposal practices were also inefficient. Because the price of goods did not reflect the cost of adequate management of the wastes produced as part of the manufacturing process, these goods were priced too low relative to other goods. Because prices were lower than the true social cost of producing the product, consumers were able to buy more of these goods than they would have if proper waste management costs were included in the product price. Thus, companies manufactured and sold more of these products and manufactured more hazardous waste than was economically efficient. These products were thus placed at an unfair advantage over competitive products which generated no hazardous waste. Furthermore, since companies did not have to either pay the cost of proper waste management or pass it along to customers, there were no incentives to find technology and process changes to lessen the quantity of hazardous waste generated or to recover the wastes as a useful material. Additionally, companies who wished to adequately manage their wastes were put at a competitive disadvantage in doing so since they bore costs which their competitors did not.

The RCRA Subtitle C Regulations will ensure that those generating the hazardous wastes pay appropriately for their safe management. Some of this cost will be passed on to consumers, while some will be borne by the generator. In either case, the economy will be more efficient and equitable, since those receiving the benefits will also pay the costs, and prices will serve as an efficient allocator of resources.

In recent years, with increasing frequency, society has been forced to properly dispose of waste that were previously disposed of haphazardly. The best recent example of this is Love Canal. The diagnosis of a severe health hazard in the area, caused society to take remedial action. The price tag to the State and Federal governments is expected to be about $36 million for cleanup, relocating residents, health and environmental testing services, and other expenses associated with the disaster. Thus society is spending about $1800 per ton, in its effort to cleanup waste improperly disposed of and more will be spent before the area is returned to normal. Further, the $1800 per ton excludes human health costs and suffering, which might easily outweigh monetized cost. Given that average disposal costs after RCRA will be only around $80 per ton, it clearly pays to do the job right in the first place.

Given that damages often take decades to be recognized, we may be paying dearly for past waste mismanagement, for many years to come. Further, without the regulatory program, we

would continue to develop new problem sites. Ultimately, cleanup of all of these sites could escalate into the billions of dollars annually.

b. Costs

While it is more equitable for the generating industry and the consumers of products from that industry to bear the cost of proper hazardous waste management, a regulatory program which causes this to happen over a relatively short period, will increase the costs of producing products which generate such wastes. Some industry sectors, because of foreign competition or other factors, may not be able to raise prices enough to offset the increased costs, resulting in a profit squeeze. In the most extreme cases, personnel layoffs and plant closings may result.

To analyze the potential for these impacts, EPA has performed an economic impact analysis. Copies of the analysis are available for review in the EPA regional office libraries and in the EPA headquarters library, Rm. 2404(M), Waterside Mall, 401 M St., S.W., Washington, D.C. 20460. Only a draft of the Economic Impact Analysis is currently available in those locations. Because of the substantial lead time necessary (about 3 months) to determine the impacts, and the fact that substantive changes were made to the regulations late in the process, the draft unavoidably does not correspond totally to the promulgated regulations in several areas. In most instances, the alterations have led to cost reductions. For instance, a number of changes which would greatly reduce the amount of waste covered by the regulations have not been factored

into the analysis. Also the financial requirements have been deferred in the regulations but are still covered in the economic impact study. On the other hand, control of underground injection has been added to the regulations, but it is not covered in the EIA. The Agency will reestimate these impacts based on the promulgated regulations, and plans to issue a summary in several months. This summary will be published by the National Technical Information Service of the Department of Commerce, Springfield, Va.

The Economic Impact Analysis studied parts of 22 industies.(1) These are listed in Table 2. Nearly all of these are manufacturing industries; however, not all manufacturing industries were studied. There are other industries which generate hazardous wastes but the data base available is not sufficient to fully characterize them. The Agency chose those sectors where wastes covered by the regulations were most likely to occur and on which data were available for analysis. Based on 1978 data, in aggregate, the industries which were studied account for 29,000 of the expected 67,000 hazardous waste generators affected by these regulations. It is estimated that they produced 13.7 million metric tons of hazardous waste. These generators had sales of about $300 billion and their value added was over $100 billion.

Note: (1) Actually the Agency is studying an additional industry, metals mining, which is not included in this summary. The calculations had not been completed and there are major questions as to whether significant quantities of waste from this industry will prove hazardous.

For the industry sample that EPA studied, the interim status regulations will cost about $510 million per year on an annualized basis. This is an incremental cost, over and above what firms currently pay for waste management. Of this annualized cost, about 50% is for surface impoundments.

EPA computes costs on an annualized basis because actual outlays during interim status will vary from year to year. For example, some one-time compliance costs occur immediately, while large outlays for closing the various facilities might not occur for 20 years or more, depending on the facility life. To smooth this uneven flow, EPA computes an annualized cost by annualizing the present value of capital expenditures and initial outlays and adding this amount to the recurring operating and maintenance costs.

Recurring annual costs are $430 million(1) per year. Capital costs are $200 million(1) and initial costs are $110 million.(1)

Annualized, these costs are less than 0.2 percent of the value of sales of the affected industries. This percentage will decline over time because of the amortization of initial capital expenses.

Note: (1) The annualization factor applied to both capital and initial costs is .27 which is predicated on a high inflation rate. The annualized capital and initial costs are in nominal dollars.

The cost for interim status can be put in perspective by comparing it to the cost of the RCRA regulations proposed on December 18, 1978. The draft economic impact analysis estimated an annualized incremental cost of $861 million for complying with the proposed regulations. It should be noted that the draft economic impact analysis did not include surface impoundments. Also the draft was based on the full regulatory program, not on the more limited interim status regulations promulgated here.

The incremental, annualized costs of the regulations for interim status can also be displayed by type of activity which would be necessary to comply. This distribution appears in Table 1. The incremental compliance costs for the industries studied appear in Table 2.

Table 1

Distribution of RCRA Costs by Type of Requirement[1]

Compliance Activity	Annualized Incremental Cost (Millions of Dollars)	Percent of Total Cost
Closure/Post-Closure	$303.3	59%
Treatment and Disposal	56.8	11
Monitoring/Testing	67.5	13
Administration	28.7	6
Contingency Planning	23.2	5
Recordkeeping/Reporting	15.2	3
Training	15.8	3
Total	$510	

1/ Detail does not add to total due to independent rounding.

Table 2

Distribution of RCRA Costs by Industry

	Industry	Annualized, Incremental Cost (Millions of Dollars)	Percent of Total Cost
1.	Agricultural Services	7.3	1.4
2.	Battery Manufacture	4.3	0.8
3.	Chemical Warehouses	(1)	0.0
4.	Drum Reconditioning	0.7	0.1
5.	Electronic Components	9.7	1.9
6.	Electroplating	80.7	15.8
7.	Explosives	7.6	1.5
8.	Ferrous Metals	40.7	8.0
9.	Inorganic Chemicals*	49.8	9.8
10.	Leather	11.8	2.3
11.	Non-Ferrous Metals	64.2	12.6
12.	Organic Chemicals*	13.3	2.6
13.	Paint Manufacture	4.4	0.9
14.	Pesticides Manufacture	84.1	16.5
15.	Petroleum Refining	48.2	9.5
16.	Petroleum Rerefining	1.4	0.3
17.	Pharmaceuticals	7.0	1.4
18.	Plastics and Synthetics	35.0	6.9
19.	Rubber	6.1	1.2
20.	Special Machinery	4.6	0.9
21.	Textiles	23.3	4.6
22.	Wood Preserving	5.8	1.1

Note: */ EPA was unable to analyze all segments of these industries. For inorganics the Agency looked at chrome pigments, titanium dioxide, sodium dischromate, boric acid, phosphorus penta sulfide, phosphorus trichloride, and chlorine. EPA examined ethylene dichloride, vinyl chloride monomer, chloromethanes, perchloroethylene, acrylonitrile, chlorobenzene, benzylchloride, epichlorihydrin, ethanolomines and furfural for the organic chemical industry.

The draft Economic Impact Analysis, which accompanied the December 18, 1978 proposed regulations qualitatively discussed the potential economic impacts of complying with the proposed regulations. As a result of these preliminary findings the Agency performed quantitatve analyses of six industries using an early draft of these final regulations, covering textile manufacturing, leather tanning, nonferrous smelting and refining, inorganic chemicals (chrome pigments, titanium dioxide, sodium dichromate, and chlorine), organic chemicals (ethylene dichloride and vinyl chloride monomer, chloromethanes and perchloroethylene, and acrylonitrile), and electroplating. These analyses were based on applying basic capital budgeting techniques to model plant representations of the industries. The projected impacts are shown in Table 3.

Table 3

Summary of Projected Economic Impacts of the RCRA Interim Status Standards on Selected Industries

Industry	Plants Generating Hazardous Waste(#)	Potential Closures(#)	Potential Job Losses	Possible Price Increase (%)	Possible Production Loss (%)
Organic Chemicals	45	0	0	0	0
Nonferrous Smelting & Refining:	252	2	500-1500	<1	<1
Secondary Lead	64	1	15	<1	<1
Primary Zinc	6	1	500-1,500	0.7 - 1.1	0.7 - 1.4
Inorganic Chemicals:	95	3	607	<1	<1
Sodium Dichromate	3	1	45	Not available	<1
Titanium Dioxide	13	2	562	Not available	<1
Textiles:	1166	10	740	0	<1
Woven Fabric Finishing	336	8	414	0	<1
Felted Fabric Processing	19	2	326	0	8.0
Leather Tanning:	271	11	795	<1	1
Cattlehide Nonchrome	16	6	695	1-3	<1
Sheep (no beamhouse)	29	5	100	0	6.3
Electroplating:					
Job Shops	2,336	60	1,680	6.6	2.5
Total	4,165	86	5,322		

EPA also performed qualitative impact analyses for 17 other industries. Preliminary data indicate that only portions of a few of these other industries may suffer substantial adverse impacts from complying with the regulations. These firms are in the explosives, pesticides, petroleum rerefining, and some organics, plastics, and pharmaceutical industry sectors.

The Agency conducted a supplemental study specifically to assess the potential costs of compliance with the surface impoundment regulations during the interim status period. This study covers all industries with impoundments.

The study identified the costs of compliance with the surface impoundment requirements assuming there were no other waste control options. In the real world, some firms would have options and would switch waste management techniques. It includes operating and administrative requirements, ground-water monitoring, remedial action provisions, and requirements for closure and post-closure care.

Costs for compliance range from a low figure of $60 million per year to a high of $900 million per year, depending on assumptions about site life and how many and what size impoundments will contain regulated hazardous wastes. As mentioned previously, the cost of the surface impoundment requirements to the industries studied in the main economic impact analysis is $285 million.

The Agency made a major assumption for this analysis that sites with impoundment surface areas greater than 150 acres would close at 25 million dollars, although strict use of its closure

cost equation showed a substantially higher cost. EPA based this assumption on: (1) the uncertainty in the data base for the size of large impoundments and their actual receipt of hazardous waste and (2) the belief that industry would most often provide acceptable closure plans that would be cheaper than the conservative closure approach used to develop the cost equation. If EPA had strictly applied the equation, and if many of the very large impoundments in fact contain hazardous wastes, then the approximate annual cost would have been considerably higher. The $285 million cost included for the industries covered in the main economic impact analysis, has <u>not</u> been restrained by the 25 million dollar limitation.

RESOURCE IMPACT

The Agency, in accordance with Executive Order 12044, has prepared an Operations Resource Impact Analysis. This analysis identifies the key activities and associated expenditures necessary to implement and administer the hazardous waste management program established by these regulations. A copy of this document is available for review at the EPA regional office libraries and at the EPA headquarters library, Room 2404(M), Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460.

The Resource Impact Analysis provides the Agency's best estimate of both State and EPA resource needs for implementing the full RCRA Subtitle C program, the requirements for which the Agency plans to promulgate in Phase II later this year. The analysis, is, therefore, not directly applicable to the interim status regulations; only a portion of the total estimated resources will be needed during the interim status period. However, since the interim status program is expected to exist by itself for such a limited time, governmental agencies must gear up now to manage the expected full program when the regulations are promulgated for that program (in about six months). Thus, development of resource estimates to manage only the interim status program would not be useful.

The analysis provides resource estimates of the following key activities necessary to implement EPA's hazardous waste

program: administering the program, monitoring the manifest system to track wastes from generation to disposal, processing permits for hazardous waste management facilities, and assuring compliance with RCRA and the regulations.

The analysis concentrates on State resource needs, since Congress intended for States to implement the hazardous waste program after they are authorized by EPA. EPA will implement the program only in unauthorized States. These estimates are based on a preliminary estimate that 35 States will seek and be granted authorization to carry out the program. Any change in this number will shift the State/EPA ratio of resources. The Agency's resource estimates indicate that over a six-year period through fiscal year 1985, 15,300 workyears of effort (a workyear is the equivalent of one person working full-time for one year) will be required by State governments to initially implement a program substantially equivalent to the Federal program, and to eventually implement a fully equivalent State program. Over this same six-year time period, EPA will need to devote about 2,200 workyears of effort to implement the hazardous waste program in unauthorized States and conduct oversight activities in authorized States. These estimates referenced below represent the State and EPA resource requirements necessary to launch and implement a responsible hazardous waste program.

Table 4
STATE/EPA RESOURCE ESTIMATES (Workyears)

	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	Total
States	700	1300	2600	3700	3500	3500	15,300
EPA	100	500	500	500	300	300	2,200
Total Workyears	800	1800	3100	4200	3800	3800	17,500

RESOURCE ESTIMATE OF FOUR MAJOR ACTIVITIES (Workyears)

Activity	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	Total
Administration	500	800	700	1000	600	600	4200
Manifest	--	200	200	200	200	200	1000
Permitting	--	500	1800	2500	2500	2500	9800
Compliance	300	300	400	500	500	500	2500
Total Workyears	800	1800	3100	4200	3800	3800	17,500

Source: U.S. EPA Operations Resource Impact Analysis, April 1980

REPORTS IMPACTS

This discussion covers the recordkeeping and reporting requirements of RCRA Sections 3002, 3003, 3004, and 3010. The estimates include essentially all of the paperwork requirements associated with these Sections, even some items such as development of inspections plans, which are not traditionally thought of as recordkeeping and reporting activities. In the Economic Impact Analysis report, costs of these other activities are included with the appropriate technical activity and are not tallied under the recordkeeping and reporting activity. This will account for some discrepancies between the Report Impacts Analysis data and data from other reports discussed in this Regulatory Analysis. Because of the lead time necessary to produce this analysis, it does not reflect the changes made to the regulations late in the process. The Agency is continuing

to analyze the effects of these changes. The Reports Impacts Analysis may be viewed at the EPA regional office libraries and at the EPA headquarters library, Room 2404(M), Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460.

For the proposed regulations, the universe of persons and organizations potentially affected by recordkeeping and reporting requirements was estimated at 762,000. However, the change in the small quantity exemption for generators from 100 kg/mo. to 1000 kg/mo. in the final regulations is largely responsible for greatly reducing the size of the regulated community to 72,000. The following is EPA's estimate of the universe of those affected by the Subtitle C regulations promulgated today.

Table 5

REGULATED COMMUNITY (1)

- Number of Waste Management Facilities		26,400
Surface Impoundments	7,000	
Land Disposal and Treatment	4,500	
Incinerators	1,500	
Storage Facilities	13,400	
- Generators		67,000
- Transporters		5,000
- Notifiers		72,000

Note: (1) The numbers are not additive because a substantial percentage of the waste management facilities are owned by generators.

The estimated paperwork effort required by the Section 3002 and 3003 proposed regulations was 1,120,000 hours ($16.5 million) per year. These estimates covered only 17 of the 23 waste-generating industries. EPA estimates the total annual paperwork effort involved in the final Section 3002 and 3003 regulations to be 842,000 hours ($10.2 million). These data also include costs associated with the Department of Transportation regulations which are being issued to complement the EPA manifest requirements. Much of the reduction in paperwork effort from the proposed to the final rules results from the the reduction in the number of generators affected by the regulations.

EPA's initial estimate (based on the 1978 proposal) of the paperwork effort under Section 3004 regulations came to 2,400,000 hours ($28.8 million) per year plus initial (one-time) efforts of 2,870,000 hours ($58.8 million). The paperwork effort required by the Section 3004 interim status regulations is expected to be 2,322,000 hours ($29.2 million) or just over $1100 per facility per year. The changes from the proposed regulations are minimal, resulting from the cumulative effects of a number of regulatory changes. There has, however, been a substantial decrease in the initial or one-time costs of about 50 percent to 1,424,000 hours ($32.2 million). This comes to about $1200 for the average facility. The reduction from the proposed regulation occurs in large measure from an Agency decision to defer and repropose the financial requirements

for interim status. It is expected that these regulations will be promulgated later this year and will require a significant paperwork effort.

These estimates were derived using conservative assumptions and should be viewed as an upper cost limit, but more precise information on the universe of facilities and the amount of waste covered cannot be known until the notification and annual reporting functions are implemented. See Table 6 on the following page for more details on the paperwork effort and cost of individual activities of the various Subtitle C sections.

In developing its regulations, EPA has carefully reviewed paperwork requirements to minimize, consistent with the Act, reporting burdens imposed on the public. This review, together with careful consideration of comments from the public, has led to reductions in reporting requirements as a result of:

- exemptions for certain wastes and for small volumes of waste,
- eliminating duplicative requirements of other Federal agencies and State governments,
- eliminating non-essential requirements, and
- simplifying requirements

Nevertheless, the RCRA reporting requirements remain substantial. The RCRA regulatory program was meant by Congress

to provide control over hazardous waste management. And, unfortunately, exercising control in an effective and equitable manner requires that substantial information be collected and analyzed. In developing these regulations, the Agency has attempted to pare these requirements to the bare minimum. However, since RCRA is a new program, EPA plans to carefully review the recordkeeping and reporting requirements in light of practical experience over the next several years and may be able to implement further reductions in paperwork requirements.

Table 6

REPORTING IMPACTS RCRA

Section	Requirement	Impact			
		Hours		Dollars	
		One-Time	Annual	One-Time	Annual
3002	1. Waste documentation	87,000		1,600,000	
	2. Manifest management				
	EPA		395,000		4,010,000
	DOT		168,000		2,020,000
	3. Annual report		88,000		1,720,000
	4. Exception report		17,000		400,000
	TOTAL §3002	87,000	668,000	1,600,000	8,150,000
3003	Manifest Management	--	174,000	--	2,080,000
3004	1. Annual report		320,000		4,900,000
	2. Manifest management		386,000		3,100,000
	3. Monitoring plans	289,000		6,190,000	
	4. Operating records		1,616,000		21,230,000
	5. Waste analysis, inspection, contingency plans	879,000		20,770,000	
	6. Closure/Post-Closure plans	256,000		5,230,000	
	TOTAL §3004	1,424,000	2,322,000	32,190,000	29,230,000
3010	Notification	116,000	--	2,720,000	--
TOTAL		1,627,000	3,164,000	36,510,000	39,460,000

EVALUATION PLAN

In response to Executive Order 12044, Improving Government Regulations, EPA is developing evaluation plans for all new significant regulations. The RCRA Evaluation Plan described here represents a substantial Agency initiative to develop comprehensive plans for its regulations.

The purpose of the evaluation plan is to test how effective a regulation is in achieving its defined goals and to determine whether modifications are needed to achieve those goals. Accordingly, the plan provides a framework for clarifying and testing expectations, identifying problems, and deciding what revisions are needed in the program to improve its effectiveness and minimize the regulatory burden. The plan provides measures for evaluating the regulations and prescribes a schedule for periodic collection and analysis of data needed to evaluate and manage the program. The Evaluation Plan is available for review in the EPA headquarters library, Room 2402(M), 401 M Street, S.W., Washington, D.C. 20460.

The evaluation plan, like the regulations themselves will be modified as time goes on to respond to changing information needs. The plan anticipates that those information needs will vary over time, and the specific issues now viewed as crucial in evaluating the program's effectiveness may change as EPA gains experience with the regulations and makes revisions reflecting that experience.

Three basic types of questions are involved in evaluating a regulatory program:

- Is the regulatory program operating as planned--in the case of Subtitle C of RCRA, such questions are: Have identification numbers and permits been issued to waste handlers? Have States been authorized, etc?
- Does the regulatory program trigger the desired industry response--for example, has industry complied with regulations issued under Subtitle C of RCRA?
- Do adopted industry management practices adequately resolve the original problem--in this case, has the program reduced damage to the environment and public health from hazardous wastes?

To answer these questions, the Agency will focus on three aspects of the RCRA Subtitle C program--the implementation of regulatory processes, industry response to those processes, and the impact of government and industry actions on the flow of hazardous wastes into the environment. The Agency will also examine the assumptions and expectations linking these three aspects of the program.

The Agency has developed initial evaluation designs for each of the major components of the hazardous waste program.

Each provides a framework for assessing EPA and State progress in implementing the program. To date, 11 major components have been distinguished for evaluation and management purposes. They include eight "process" components and three "technical" components:

Procedural or "Process" Components

- o Notification and Identification Process
- o Manifest System
- o Facility Permitting
- o Public Education and Involvement
- o Recordkeeping and Reporting
- o Enforcement
- o State Authorization
- o Development and revision of regulations

Technical Components

- o Lists and characteristics of HW identified
- o Interim status standards
- o General status standards

Each specific evaluation component includes the following:

- o A description of the implementation steps and measures
- o A description of the expected outcomes and measures
- o For each measure, an identification of data source, reporting schedule, assessment of collection and reporting responsibility, comparisons to be made, and uses of information

When implemented, these analyses will cover such topics as:

- o whether planned activities are occurring at expected levels, on programmed schedules, and with allocated resources;
- o whether there are backlogs in issuing identification numbers or facility permits;
- o the extent of State authorization and any problems encountered in attaining State authorization;
- o the level of enforcement and follow-up on complaints and information submitted to EPA; and
- o other EPA and State actions required for the hazardous waste management process to function.

The results of these analyses may lead, among other things, to modifications in the regulations to improve effectiveness or efficiency, to a change in enforcement priorities, or to changes in procedures for managing the permitting process.

The plan provides EPA with a means of isolating implementation problems and for establishing a baseline for assessing the cost and effectiveness of the regulatory components.

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